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ABSTRACT

Thirty-two fourth grade students were divided into two equal-sized groups according to reading ability. Each student read and recalled four passages from fourth-grade texts. The passages were either an original version, a semantic simplification, a syntactic simplification, or a combined rewrite. One week later, each child read and recalled alternate versions of the same passages. Able readers recalled significantly more appropriate responses in all passage versions on each test day than did the less able readers. Their recall for all but the combined versions was approximately the same for the two days. Able readers also, produced more details from the combined versions. Both groups remembered most of the superordinate propositions on both days, suggesting that improvement in recall was the result of remembering subordinate propositions. Less able readers remembered proportionately more with semantic simplification than with the original and syntactically simplified versions. For all subjects, the syntactic/original combination depressed recall during the second reading, and the semantic/combined versions increased it. (Sample passage versions are included.) (TJ)

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Effects of Semantic or Syntactic Simplification on Recall

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Abstract

Most prose recall studies find that delayed recall is a diminished replicate of immediate recall. This study examines the recall of 32 fourth graders, 16 able and 16 less able readers as determined by teacher specification and the results of an informal reading inventory. Each student read and recalled four passages from school texts on day one and then again on day two, but this time the passages were re-written according to specified syntactic or semantic simplification rules.

The findings indicate that semantic simplification, replacing anaphoric elements with the lexical referent, improved both text and inferred recall over syntactic simplification, re-writing so that each sentence was an active, simple or compound sentence. Semantic simplification also changed the content of the retained information. Though able readers recalled more text and inferred material under all conditions, the less able readers remembered proportionately more with semantic simplification than under the original and syntactically simplified versions. This result is a tenuous indication that finding referents for anaphoric elements may be a problem area for poorer readers.

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Effects of Semantic of Syntactic Simplification on Recall

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The myriad facets of printed discourse, where isolated, can and have affected readers' responses. The frequency of words within a passage is more powerful than language frequency upon cloze scores (Finn, 1978). An increase in number of different arguments within propositions makes the propositions less reproducible (Kintsch, 1974). Children are generally less aware of some of the nodal slots of story structure than adults (Mandler, 1977; Thorndybe, 1977). The principles of definitization had an effect on responses of college undergraduates (Haviland and Clark, 1974). These few examples from the empirical literature illustrate some of the complexities involved in selecting

and manipulating passage factors. The researcher must decide which factors are of interest for a particular study and how to control for possible confounding effects, not an easy task.

Passage Factors

The study presented here examines effects of two passage factors, syntactic simplification of sentences or explicit substitution of lexical referents for anaphoric or indefinite elements, upon fourth grade readers.

Syntactic simplification was selected because of a growing body of literature suggesting that children may not have control over complex subordination until adolescence (Inghram, 1975; Chomsky, 1969). However, it was hypothesized apriori that syntactic simplification would have instead an adverse effect, for the explicit relational words, such as when, because, although, etc., would have to be supplied by the reader in order to provide a superordinate/subordinate structure to the passage, a task which can make reading more difficult (Pearson, 1974). The control over passages was to compare recall responses from original passages versus those rewritten into simple, active sentences, thereby using the same thematicity and lexicon. The syntactically simplified passages had more sentences, as each clause became a sentence, and no subordinating conjunctions.

Replacement of anaphoric or indefinite elements with explicit references, the only changes made from the original, resulted from given-new results, where new information takes longer to process than given (Perfetti & Lesgold, 1977; Clark, 1977). An indefinite or anaphoric element requires the reader to search either memory or text

or both in order to supply the intended referent. Search times prolong the reading act and may interfere with the reconstruction of the information. Also, an erroneous referent can be supplied resulting in an inappropriate semantic base. The prediction was that the semantic rewrites would be best recalled, then the original versions, with the syntactic rewrites recalled least well.

A final version of each passage was a combined syntactic/semantic rewrite. The combined version was used to examine possible syntactic or semantic effects. Would the combined rewrite result in better retention generally or would it be similar to one of the other versions?

Sample Versions

The four versions of the first paragraph of Luck illustrate the different rewrites.

Original Version

In the old days in France, and very good days they were, there was a hard-working, cheerful fisherman, but never did a good fellow have worse luck. If a storm blew up, it was his nets which were carried away. If he caught no fish, the market for fish would be good. If he caught many, there would be no market at all. Yet he never complained.

Syntactic Version

There was a hard-working, cheerful fisherman in the old days in France. He had very bad luck. Sometimes there were storms. His nets

would be carried away. Sometimes he didn't catch any fish. Then the market for fish would be good. Sometimes he caught a lot of fish. Then there wouldn't be any market at all. Yet he never complained.

Semantic Version

Many years before today in a country called France, there was a hard-working, cheerful fisherman; for most people these years were very good years, but the good fisherman had terrible luck. If a storm came, the fisherman's nets would be carried away by the storm. If the fisherman caught no fish, everyone wanted to buy fish. If the fisherman caught many fish, nobody wanted to buy fish. Yet the fisherman never complained.

Combined Version

Many years ago, there was a hard-working cheerful fisherman. The fisherman lived in a country called France. These years were very good years for most people. However, the good fisherman had terrible luck. Sometimes there were storms. Then the good fisherman's nets would be carried away. Sometimes the fisherman didn't catch any fish. Then everyone wanted to buy fish. Sometimes the fisherman would catch lots of fish. Then nobody wanted to buy fish. Yet the fisherman never complained.

Subject Factors

Most reading comprehension studies, other than those of Perfetti and Lesgold (1977), examine some aspect of language and assume random

selection of readers from a single age and grade population of readers. The effects of stratified sampling from two or more populations are generally not considered. Surely if passages are complex, readers also represent differences, maybe even systematic differences. An interesting exception to the single population approach is found in the Marshall and Block Study (1978). These researchers found that Cornell students had more complete recalls generally, but they were not affected by the experimental variables, such as explicit versus implicit if - then clauses. The community college students, however, performed less well on the implicit versions. From these and other differences in recall, Marshall and Glock assumed they were sampling from two separate reading populations even though grade in school was equivalent.

In this study, the 32 fourth grade students were blocked into two groups of 16 readers each by their performances on story-telling tasks (vocabulary used and diversity of syntactic constructions), word recognition in isolation skills (both appropriate naming and reasonable definitions), and the Gray Oral Informal Reading Inventory. The comprehension results from the latter measure, those a year or more above grade level versus a year or more below grade level, were used as descriptors in defining the samples as belonging to two different reading populations in the recall analyses described here.

Procedures

Each child read and immediately recalled four passages from fourth grade texts on day one. The passages were either an orginal version, a semantic rewrite, a syntactic rewrite, or a combined rewrite. One week later, each child read alternate versions of the same passages

and recalled them.

Recall protocols were scored as text reproductions, text entailments, text evoked, and text external comments. The differences in types of recall will be reported elsewhere. In these analyses, text reproductions and entailments were summed as appropriate responses.

Results

Able readers recalled significantly more text appropriate responses in all passage versions both on day 1 and day 2 ($F=15.71$; 1,30 d.f.; $p< .001$). The means (Table 1) by passage versions indicates that the combined and semantic versions were best recalled by both groups; while the syntactic versions depressed recall, particularly on day 1. This was not a significant effect ($F=2.24$; 3,90 d.f; $p< .09$) but only a trend.

For able readers, there was a practice effect on day 2 from the original reading. Recall for all but the combined versions was approximately the same, with a slight improvement over their original performance. They seemed to have remembered enough from their original reading to have a structure for the information, which was not affected by the syntactic or semantic rewrites, but allowed them to add on some new information. The combined versions were longer (more words per passage), and this may have influenced these readers to produce more details. Both groups remembered most of the superordinate propositions on day 1 and on day 2 (a propositional analysis to be reported in another paper) and so improvement in recall was the result of remembering subordinate propositions.

Less able readers recalled proportionately more on second reading than did able readers (a gain of .26 over that of .15 for able readers),

but were also favorably influenced by the semantic versions (Table 1).

The above results were collapsed over the four passages. The effects of re-write on a specific passage were examined. In this analysis, the subjects' performances on Luck on Day 1 were subtracted from their performances on Day 2. The original and syntactic versions were summed as were the semantic and the combined versions. Here, the question was what would be the effects upon retention of reading the most favorable versions originally or as a second reading. The syntactic/original combination depressed recall during the second reading ($\bar{x}$=-.61), and the semantic/combined versions increased it ($\bar{x}$ = 27.6). This effect includes all 32 subjects.

Conclusions

One can improve recall of information by reading the same passage twice. Unless the passage is in some way very important, this would be an inefficient course of action. One can improve recall by making all reference precise and exact, thereby deleting anaphoric elements. This would be a readability choice, which would ill prepare students for future reading. Simplifying texts may be counter productive, for the desired goal is that a reader be able to read anything he wishes to or is required to with comprehension and retention of the information needed for the particular situation. Thus, proposed subsequent studies will attempt to replicate day 1 effects, intervene with referential training procedures, and then re-test on different passages to see if the semantic simplification effect can be erased. Again, both populations (able and less able readers) will be sampled, for the intervention strategies may affect the two groups differently. Both

of these syntactic and anaphoric changes can be manipulated while still controlling possible thematic and/or propositional differences. Thus there may be a way of examining instructional intervention effects, if there are any, which may aid in comprehension instruction.

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Table 1

Means and S.D.'s For Able and Less Able Readers by Passage Versions

	Original n=16		Syntactic n=16		Semantic n=16		Combined n=16	
	M.	S.D.	M.	S.D.	M.	S.D.	M.	S.D.
Day 1								
Able Readers	44	27	34	21	49	30	51	28
Less Able Readers	22	17	21	20	25	19	28	13
Day 2								
Able Readers	51	31	50	22	51	21	57	28
Less Able Readers	30	23	30	17	37	22	32	14